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ABSTRACT

Reported is the 1968-69 school year of Vermont's Consulting Teacher Program (Burlington) during which eight regular elementary school teachers successfully completed the first half of an inservice program in behavior modification, programing, consulting, and research skills; and provided special educational services for 50 handicapped learners in regular classrooms. The report explains the program's rationale (focusing on potential advantages of regular class placement of handicapped learners and on estimated costs of special class and consulting teacher approaches) and methods (including behavior theory, service and research activities, teacher preparation, and dissemination of skills and knowledge). The summary of program results, in which program projections are compared with actual accomplishments, indicates that participating teachers developed methods to measure educational deficits of handicapped children on a daily basis, that measured educational deficits were ameliorated through applications of behavior modification principles, and that the effectiveness of such application was researched through functional analyses of behavior. (GW)

SUMMER PROGRAM
SPECIAL EDUCATION PROGRAM
UNIVERSITY OF VERMONT

THE
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CONSULTING TEACHER PROGRAM

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A COOPERATIVE EFFORT
of
The College of Education, University of Vermont;
Division of Special Educational and Pupil Personnel Services
of the Vermont State Department of Education
and
Selected Vermont School Districts

•Funded Under Title VI-A, E.S.E.A.•

VOLUME I

EC 070 406

1968-1969 Yearly Report of the Consulting Teacher Program

Volume I

The project presented or reported herein was performed pursuant to Grant 554145-69, Title VI-A, Elementary and Secondary Education Act, from the U.S. Office of Education, Department of Health, Education, and Welfare to the Vermont State Department of Education. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred.

THE UNIVERSITY OF VERMONT
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CONSULTING TEACHER PROGRAM
2 COLCHESTER AVENUE

A cooperative project of the College of Education, University of Vermont; Division of Special Educational and Pupil Personnel Services of the Vermont State Department of Education; and five school districts in Chittenden County (Burlington, Chittenden Central, Chittenden South, South Burlington, and Winooski); funded under Title VI-A, Elementary and Secondary Education Act.

During the 1968-1969 school year, the Consulting Teacher Program provided special educational services for 50 handicapped learners in regular elementary classrooms. Eight regular elementary teachers successfully completed the first year of a two year inservice program in behavior modification, programing, consulting, and research skills. In cooperation with a consulting teacher and a psychologist, participating teachers developed methods to measure educational deficits of handicapped children on a day-to-day basis. Such measurement procedures were undertaken in the classroom as an integral part of general teaching/learning procedures. Measured educational deficits were ameliorated through applications of principles of behavior modification. The effectiveness of such application was researched through functional analyses of behaviors of concern. Materials to supplement those typically available to an elementary teacher were developed by the program staff when such development was warranted by children's handicaps. Participating teachers conducted service/research projects for 35 handicapped learners enrolled in their classrooms. In addition, participating teachers assisted other teachers who requested their services in the management and education of 15 other handicapped learners. For the ensuing year, seven teachers were granted an additional day of released time from teaching duties, thus providing a total of two release days per week for consulting and service/research activities.

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PREFACE

The Consulting Teacher Program agrees with the spirit of the Vermont Design for Education in that consulting teachers help other teachers to provide individualized instruction for each child, to allow for different rates of learning, to establish success for each child, and to insure social growth.

Teachers may ask, "How do I reach the child who isn't learning his arithmetic facts, or the child who presents a serious behavioral problem?" The handicapped learners present both a problem and a challenge to the teacher. The Consulting Teacher Program is an attempt to help the teacher meet this challenge. This report presents the rationale and method of the program and the results achieved during its first year of operation.

The staff of the Consulting Teacher Program wish to acknowledge with gratitude the assistance and courtesy extended by the personnel of the University of Vermont, the State Department of Education, Division of Special Educational and Pupil Personnel Services, and participating school districts. Our special appreciation is extended to Joel Cherington who through incisive logic and energy in planning and writing the proposal for the program made possible its realization. Thanks are also due to Carolyn Cherington for thoughtful proof reading and typing of the proposal, and to Sheldon Miller for preparing the excellent cover and graphs for this report. In addition, thanks are extended to R. Vance Hall, Associate Progessor of Special Education and

Human Development at the University of Kansas, for his comprehensive and instructive evaluation* of the program.

* Copies of a written report of this evaluation are available upon request from Miss Jean Garvin, Director, Division of Special Educational and Pupil Personnel Services, Vermont State Department of Education, Montpelier, Vermont, 05602.

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Chapter One
The Consulting Teacher Program: Rationale and Method

The Consulting Teacher Program is a cooperative effort of the College of Education, University of Vermont; the Division of Special Educational and Pupil Personnel Services, Vermont State Department of Education; and selected Vermont school districts. Currently, the Burlington, Chittenden Central, Chittenden South, South Burlington, and Winooski school districts are participating in the Consulting Teacher Program.

The Consulting Teacher Program seeks to manage and educate handicapped learners * within regular classrooms by recognizing individual differences and providing teachers trained in skills needed to individualize instruction. In cooperation with a consulting teacher and a psychologist, regular classroom teachers develop methods to measure educational progress and deficits of handicapped children on a daily basis. Measurement procedures are undertaken in the classroom as an integral part of general teaching-learning procedures. Measured educational deficits are ameliorated through applications of principles of behavior theory. Applications are researched as to effectiveness through functional analyses of behaviors of concern. When warranted by children's handicaps, learning materials to supple-

* The term handicapped learner refers to those children who are retarded, crippled, neurologically impaired, severely emotionally disturbed, and/or learning disabled.

ment those typically available to elementary children are developed by the program staff. Teachers participate in extensive in-service training in behavior theory, programming, consulting and research skills. These teachers, at the completion of their training, will be available to assist and train other teachers in the management and education of handicapped children within regular classrooms.

RATIONALE

The problem.

In Vermont, the education of handicapped learners is virtually restricted to special classes conducted in public schools or in quasi-public institutions, and to out-of-state or home-bound instruction. About 1600 handicapped children and adolescents are currently being served through the above educational programs. Utilizing Heller's (1968) expectancy estimate that ten percent* of school age children are handicapped learners, approximately 10,000 of the 100,000 school age children in Vermont are handicapped learners. Thus, only 1600 of an estimated 10,000 handicapped learners are being served through special educational instruction. This leaves an estimated 8400 children yet to be served.

* Ten percent is probably the lowest published estimate, as most "conservative" estimates range from 15 to 20 percent. For example, Denhoff and Novack (1967) estimate that 16 percent of school age children are handicapped.

The problem which faces Vermont is that of providing adequate education for these 8400 children who are currently expected to progress in learning environments established for non-handicapped learners. Two general approaches could be effected for the solution of this problem. One approach would be to remove the 8400 children from regular classrooms and place them in special classes with special teachers. Essentially, this is the approach for the 1600 handicapped Vermont learners who are now being served. A second approach, that of the Consulting Teacher Program, would be to retain the 8400 children in regular classes, while providing the teachers of these classes with special training, materials, and consultant help.

Apparently, some handicapped learners can be managed and educated effectively only within special classes. For the purposes of this report, however, it is assumed that at least 84 percent of handicapped learners (8400 children in Vermont) could be served effectively through a consulting teacher, regular class approach.

Potential advantages of educating handicapped learners in regular classes.

Educating the handicapped learner in regular classes would negate the necessity of labeling this learner. If handicapped learners were not labeled, the need for extensive, formal psychological and educational evaluation could be decreased. It might be argued that such evaluation is necessary

only to label a child for special class placement. Educational evaluation may not discover anything more about the child with learning problems than that which could have been observed by the child's teacher in the daily learning situation. In fact, if teachers (and/or parents) did not observe a degree of inappropriate and deficit behaviors in a child, it is improbable that the child would be referred for individual testing. Individualized testing has the additional disadvantage of measuring behavior outside the learning situation and sampling a narrow cross-section of behavior at a single and isolated point in time. Results of standardized testing do not prescribe teaching-learning procedures and educational materials which should be employed to educate the child who is handicapped. Apparently, if labels were no longer needed, time and resources invested in individual, standardized testing could be reduced, freeing skilled professionals to work toward providing effective educational programs for all children.

Labels are non-functional in regard to developing a treatment program for a child. For example, if a child has been labeled emotionally disturbed, this tells neither teacher nor parent what needs to be done to help the child progress socially and educationally. Labels may have the disadvantage of leading the child so labeled to expect less of himself - to expect that he will engage in inappropriate and deficit behaviors. Moreover, when children have been labeled, teacher expectancies may influence the growth or lack thereof of children (Rosenthal and

Jacobson, 1966). A label can attach stigma to a child and serve to isolate and alienate him from his peers.

Further isolation of the handicapped learner occurs in the special class placement itself, for often handicapped learners must be bussed to special classrooms which are away from their home neighborhood. In some instances, handicapped children must live far from home, family, and friends in order to receive special instruction. Dunn (1968) has reviewed the litigation and court action which has argued that labeling and special class placement involve discrimination and segregation. In one case to date, the courts disallowed labeling and special class placement of a group of handicapped learners as a form of segregation.

Bateman (1967) has presented evidence that when certain types of handicapped learners are placed in regular classrooms, their peers show a greater appreciation of positive characteristics of handicapped learners and greater understanding of their disabilities. Regular class placement of handicapped learners has the further advantage of offering normal and superior peer models. When handicapped learners are placed in a special class, often it is the case that their inappropriate and deficit behaviors increase rather than decrease. One factor leading to such an increase may well be that peer models of the special class present inappropriate behavior to be imitated.

Regular class placement enhances opportunities to employ a peer tutor system. Normal peers of handicapped learners can

be enlisted to help a child overcome his deficits in many ways. If the teacher and key adults in the environment set an appropriate, accepting climate for handicapped learners, and if they provide models and specific instructions to normal peers in regard to how one should respond to handicapped learners, the result can be a powerful force promoting amelioration of deficits and acceleration of development of the handicapped.

Estimated costs of special class and consulting teacher approaches to the education of handicapped learners.

The following table summarizes estimated costs of special class and consulting teacher approaches, including the savings offered by a consulting teacher approach.

Estimated Costs* in Dollars

	Construction & Equipment	Teacher Preparation	Yearly Operation
Special class approach	$7,371,000.	$3,500,000.	$4,690,000.
Consulting teacher approach	$2,992,500.	$2,520,000.	$4,200,000.
Savings offered by consulting teacher approach	$4,378,500.	$980,000.	$490,000.

* The manner in which costs were estimated may be found in Appendix A.

Summary of the rationale of the Consulting Teacher Program.

The consulting teacher or regular class approach to the education of 8400 handicapped learners appears to have the following advantages: (1) costs less than those of a special class approach, (2) avoidance of the stigma of labels and elimination of extensive standardized testing, (3) avoidance of discrimination and segregation, (4) opportunities for normal children to appreciate and understand handicapped learners, and (5) greater opportunities to employ peers as both formal and informal tutors.

There exists research evidence, reviewed by Dunn (1968), which indicates that at least some handicapped learners placed in regular classrooms progress as well as comparable children placed in special classrooms, in spite of the fact that regular classroom teachers typically do not have special training in the education of handicapped children. Thus, by providing teachers with special training, and by developing the teaching-learning procedures and instructional materials needed to individualize instruction, it would seem both possible and advantageous to achieve within regular classrooms satisfactory educational growth for handicapped children.

METHOD

The Consulting Teacher Program has restricted itself to working with handicapped children in elementary schools. It

appeared most beneficial to focus on elementary children as the problems of many handicapped learners then might be ameliorated early in their educational programs.

In individualizing instruction, the Consulting Teacher Program emphasizes the development of the basic academic behaviors in handicapped children. These behaviors include those involved in attending, writing, arithmetic, and reading, and appear to be prerequisite to full educational development.

The method of the Consulting Teacher Program is based on the set of learning principles which is termed behavior theory. Because the understanding and evaluation of the Consulting Teacher Program depends upon at least a beginning understanding of behavior theory, a brief introduction to behavior theory is presented below. The interested reader can find fuller explications in Bijou & Baer, 1961: Skinner, 1953, 1968: Staats, 1968: and Ullmann & Krasner, 1956.

Introduction to behavior theory.

Behavior is defined as anything a child does which is observable by at least two people. Thus, behaviors include only public events such as waving, smiling, and speaking. Private events, such as dreams, feelings, and desires, are not included in behavior theory.

Once a given behavior has been defined, all other objects and events in the environment are called stimuli. For example, if a child's behavior has been defined as writing down answers to arithmetic problems, then the arithmetic paper, the teacher

and his actions, and other children in the room are all examples of stimuli in regard to the "writing-down-answers" behavior. Stimuli include only those objects and events which are observable by at least two people.

One general class of behavior with which teachers must deal is termed operant behavior. Operant behavior is mainly controlled by stimuli which follow the behavior. Examples of operant behavior are reading, writing, counting, walking, and talking. Stimuli which follow operant behavior are called consequential stimuli. One class of consequential stimuli is called a reinforcer. When a reinforcer regularly follows an operant behavior, this behavior increases in strength. The more immediately a reinforcer follows a behavior, the more effective the reinforcer. Reinforcers applied to behavior(s) incompatible with a second behavior can serve to decrease the strength of the second behavior. Examples of reinforcers for some school children are teacher praise and attention, school marks, allowances, and activities such as bike riding and painting.

A second class of consequential stimuli which controls operant behavior is called a punisher. When a punisher regularly follows an operant behavior, this behavior decreases in strength. The more immediately the punisher follows the behavior, the more effective the punisher. Examples of punishers for some school children are spanking, failing school marks, and loss of favorite activities, such as recess and watching T.V.

Punishers may weaken behaviors besides the behavior to which the punisher is applied. In addition, punishers may increase the occurrence of behaviors incompatible with maximal educational growth. By being paired with punishers, the agent who administers the punishers and the situation in which punishers are employed also may increased behaviors incompatible with growth.

Having none of the above drawbacks, reinforcers are the consequential stimuli of choice. Punishers should be used only when inappropriate behaviors are so persistent and frequent that incompatible appropriate behaviors can be reinforced only occasionally. Moreover, punishers should be emplcyed only in conjunction with the concurrent use of reinforcers.

To apply the principles of behavior theory to bring about educational growth in a given child, a teacher first defines a behavior in such a way that this behavior can be measured in the school situation during some period of the school day. The behavior chosen by a teacher is usually one which he wishes to increase in strength. Occasionally, a teacher may wish to decrease some behavior in strength.

Once a behavior is chosen and defined, it is measured for at least a part of every class day. This measurement delineates a problem behavior of a given handicapped child. In this way, diagnosis is based on measures of behavior in the learning situation. The change in teaching-learning procedures warranted follows directly from measures of behavior and of stimuli which might have a possible effect on the behaviors.

Thus, behavior theory provides a unified basis for both diagnosis and treatment. So, as recommended (Bateman, 1967: Eysenck, 1960), treatment directly follows from diagnosis. Moreover, the daily measurement of behaviors allows the daily monitoring of the effectiveness of any procedures (stimuli) which have been arranged to ameliorate a given problem behavior.

Service and research.

Teaching lends itself to the conduct of research. A basic task which teachers must undertake is the measurement of children's progress, and measurement is fundamental to research. To undertake research in a teaching-learning situation, the only major addition to measurement required is to vary carefully teaching-learning procedures and note their effect on the measured progress of a given child. With the full recognition of individual differences, it is clear that the teacher's role in effecting educational growth for each child is an experimental one: the teacher must provide those learning materials and experiences which will effect growth for each child. Since there is no way to predict with certainty which materials and experiences will be effective for a given child, different materials and experiences must be provided for different children, and the effects of these on the child's educational behaviors must be monitored. Only in these ways can a teacher insure that each child in his class will develop optimally. Thus, research can be combined with providing individualized educational service to children.

In fact, it could be argued that individualized learning can occur only if teachers adopt an experimental approach.

The major emphasis of research projects of the program is the discovery of reinforcers which will increase and maintain a handicapped child's learning activities. Attempts are made first to find reinforcers from within the school environment. If such an attempt is unsuccessful, reinforcers from outside the school environment, for example, the home environment, are sought, with parents consenting to such reinforcers and perhaps aiding in their employment.

Teachers participating in the program begin their in-service research activities by defining and measuring for a given child an operant behavior which needs to be increased or decreased to promote the child's development. This period of initial measurement is called the baseline period. During this period, teachers introduce no changes in stimuli (teaching-learning procedures and materials) for the child served and studied.

Once the teacher has determined the initial level of the behavior of interest, he selects a consequential stimulus which he feels may serve as a reinforcer for that behavior. He arranges for that consequential stimulus to be dependent for its occurrence on the occurrence of the behavior. This period is called the contingency 1 period.

If, during the contingency 1 period, it is apparent that the behavior has reliably increased in strength, a third period called scientific verification is instituted by the teacher.

During this period, the teacher returns to the teaching-learning procedures which were operative during the original baseline period: the consequential stimulus is no longer made contingent for its occurrence upon the occurrence of the defined behavior. If the behavior reliably decreases in strength during the scientific verification period as compared to contingency 1, the consequential stimulus is again made contingent upon the defined behavior. This constitutes the final experimental period which is termed contingency 2. If, during contingency 2, the behavior again increases reliably in strength, the consequential stimulus is termed a reinforcer, as the function of increasing the strength of a behavior has been demonstrated through the four experimental periods.

The four experimental periods - baseline, contingency 1, scientific verification, and contingency 2 - constitute what is called a functional analysis of behavior. The functional analysis of behavior is the fundamental research procedure employed to establish that a given consequential stimulus is a reinforcer.

The functional analysis of behavior is essentially an abab design.* The a part represents a set of baseline conditions. The b part involves the employment of the consequential stimulus under test. Because the a and b conditions are repeated, this research procedure involves intra-subject replication. Through intra-subject replication, possible effects on behaviors studied

* The interested reader will find a fuller discussion of experimental designs for individual subjects in Sidman, 1960.

of stimuli uncontrolled and unobserved by the teacher are made improbable. If a reinforcer is shown to increase levels of a given behavior over a period when the reinforcer is not in effect, and if this effect can be replicated, then it is probable that this reinforcer is the variable controlling the behavior.

Once a given reinforcer has been demonstrated through functional analysis of behavior to be effective in promoting a given child's growth, the generality of this reinforcer's effectiveness in regard to other children can be tested through inter-subject replication: functional analyses of behavior with this reinforcer are undertaken with several other children. If these analyses demonstrate the reinforcer to be effective with other children, then the reinforcer can be said to have some generality. Generality tests may be extended by carrying out functional analyses of a reinforcer's effectiveness with many different children in many different classrooms with many different teachers.

A less rigorous method to determine the effectiveness of a consequential stimulus involves an ab design. A complete functional analysis is not undertaken as only baseline and contingency 1 periods are included. However, data obtained from ab designs does indicate whether or not desired changes in behavior have occurred. Also, results obtained in ab researches can be considered along with evidence from other studies in ways that lead to probable conclusions concerning the effects of stimuli in controlling behavior.

Decisions to forego complete functional analyses of behaviors are made for certain children served and studied. These

decisions may be based on such factors as lack of time to complete full functional analyses of behavior and the advisability of avoiding the risk of reestablishing, even temporarily, particularly disruptive behaviors.

One class of behaviors (C1) which teachers measure is children's written responses. C1 behaviors include written answers to reading comprehension questions and arithmetic problems. Measures of C1 behaviors included rates correct or complete, and percentages of correct or complete responses of the total responses assigned.

A second class of behaviors (C2) is all behaviors which do not involve written responses. C2 behaviors include oral answers to questions, attending to learning materials and events, sitting in the appropriate chair, and talking inappropriately. Measures of C2 behaviors include percentages of time spent attending to learning stimuli during a given academic period and frequency of being in seat or talking inappropriately.

The first step in measurement is to define a behavior in writing. Behaviors are defined as activities of learners which are observable by at least two people. This implies that a second observer, after studying a written definition of a behavior, could obtain essentially the same measure of a particular behavior as the teacher. Consulting teachers serve as second observers by taking the same measures of behaviors as the teachers. These measures of the observer insure that behaviors have been well defined. They also are used to evaluate the reliability of teacher measures.

Reliability of teacher measures of C1 behaviors is provided by the observer measuring pupils' written responses. Observer measures are compared to those of the teacher. If the two measures agree, measurement is considered to be reliable. If there is disagreement, measures are recalculated until agreement is reached.

C2 behavioral measures are also checked for reliability by an observer. In this case, observers must be in teachers' classes during times when teachers take these measures. If a time sampling procedure is employed to measure C2 behaviors, the teacher cues the observer when a measure of the behavior is to be taken. Cues include the teacher's tapping her chin with a pencil or her looking at a wall clock and nodding. Time sample measures of C2 behaviors are taken at regular intervals, for example, every two minutes.

Reliability of time sample measures of C2 behaviors is calculated as percentages of agreement between measures of teacher and observer for a given measurement period. Each sample measure of behavior made by an observer at a given time is compared to that made by the teacher at the same time. Total number of agreements of sample measures for the period are divided by total number of measures. The result of this division is multiplied by 100 to obtain a percentage of agreement. For example, if teacher and observer agree on nine of ten measures for a given experimental period, the percentage of agreement for that period would be (9/10) x 100 or 90 percent.

Observers frequently take continuous measures of a pupil's C2 behavior for a given experimental period. Continuous measures are compared with sample measures to determine if sample measures are representative of pupils' behaviors for the entire experimental period.

Reliability of measures of C2 behaviors is also checked by comparing graphical plots of teacher measures with those of observer measures. Measures are considered reliable if the two plots form similar functions.

For all children served through research projects, the program obtains full and informed consent of parents and/or guardians. Teachers and consulting teachers (introduced to parents as "teacher-associates") meet with parents to explain the purposes and procedures of the program. Consent is obtained from parents before any unusual procedures are put into effect. Parents read and sign a letter of permission for children's participation in the service and research activities of the program. A sample letter form which parents and teachers fill out and sign can be found on the following page.

THE UNIVERSITY OF VERMONT
COLLEGE OF EDUCATION
BURLINGTON, VERMONT 05401

CONSULTING TEACHER PROGRAM
2 COLCHESTER AVENUE

Letter of Permission

I consent to the participation of _____ in the educational service and research program of the College of Education of the University of Vermont under the sponsorship of the Vermont State Department of Education Plan for the education of children with learning difficulties. This service and research program will involve _____ _____'s _____ grade class of _____ _____ school in the _____ school district of _____, Vermont.

I understand that the objectives of this program are to develop and evaluate techniques for effectively educating children with learning difficulties in an elementary classroom.

I also understand that procedures will be employed by which a child may gain some desirable activity or object upon the successful completion of a task he can do, or lose a desirable activity or object should he not complete the task.

I further understand that the results of this program will be used for scientific purposes and that the strictest standards of confidence will be maintained in regard to all information.

Signature: _____
Parent or Guardian

_____
Teacher

_____
University of Vermont Teacher-Associate

Date: _____

Teacher preparation.

Teachers selected to participate in the program undertake training leading to the Master of Education degree. This training is given on an in-service basis and spans two full years and an additional summer. Teachers continue their teaching throughout the training program and apply theory and principles studied to handicapped learners in their classrooms. The districts of participating teachers pay the salaries of these teachers for the school year, while the program provides teachers with tuition reimbursements for all course work and with summer fellowships.

In order to be eligible for the program, a teacher must hold a bachelor's degree, be certifiable at the elementary level in Vermont, and be accepted by the University of Vermont Graduate College as a candidate for the Master of Education degree. Only those teachers who are recommended by their superintendents and who show the greatest promise of completing the program and remaining in Vermont are admitted.

The 30 hours of course work are designed to emphasize the following approaches to the education of the learning-handicapped child: (1) the systematic and empirical principles of behavior theory, (2) the application of these principles to meet the needs of handicapped children within the regular classroom, (3) the precise day-by-day measurement and monitoring of a child's progress to insure that reinforcers, methods, and materials are effective, (4) research training aimed at increasing teachers'

skills in devising and evaluating educational tactics to meet children's needs, (5) the development of materials which supplement those typically found in elementary schools and which meet the needs of handicapped learners, (6) special educational methods and materials for educating the handicapped, (7) training parents and teachers in the above approaches and, (8) consulting with other elementary teachers in regard to the management and education of handicapped learners.

The major part of the training of participating teachers is undertaken by a psychologist who is a faculty member of the College of Education of the University of Vermont. He teaches most of the formal courses of the program and provides psychological and research consultation. In addition, four consulting teachers of the College of Education of the University of Vermont work with participating teachers to help these teachers undertake effective educational programming and research in the development of teaching-learning procedures and materials for handicapped learners.

During the first year of their training program, participating teachers are provided one day released time per week to study for the program's courses, to develop teaching-learning procedures and materials for handicapped learners, and to tabulate and interpret data. The costs of released time are met by the Consulting Teacher Program. During the second year of training, half of released time costs is provided by the Consulting Teacher Program and half by the school district of the

participating teacher. Some released time during the second year is used by teachers to meet requests for consulting services from other teachers.

Dissemination of skills and knowledge.

One of the tasks of the Consulting Teacher Program is to make techniques developed by the program available to educators in Vermont. Ultimately and ideally, every teacher in Vermont would have the skills and knowledge of a consulting teacher. However, limited resources make it impossible for every teacher in Vermont to participate directly in the training offered by the Consulting Teacher Program of the University of Vermont. So, the major instrument for effecting this dissemination of knowledge is the consulting teacher himself. The consulting teacher, as part of his training, has been prepared to help fellow teachers learn the skills developed by the program. Through studying and working with a consulting teacher, each teacher in Vermont could gain the knowledge and skills required to individualize instruction through a research-oriented approach.

A second way in which the program seeks to disseminate knowledge is through its yearly reports. Perhaps, for those teachers in Vermont who must wait for a consulting teacher to be available to them, this first report, and the reports which follow, will be at least a useful introduction to the effective management and education of handicapped learners.

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Chapter Two

The Consulting Teacher Program: Results

This chapter summarizes the results of the first year of the Program's operation. Numbers of children to be served and teachers to be prepared were projected by the original Title VI proposal (Cherington and McKenzie, 1968). These projections are compared with actual accomplishments of the 1968-1969 year. For detailed presentations and discussions of the individual case studies, the interested reader is referred to Volume II of this report (McKenzie, 1970) and for an evaluation of the first year's activities, see Hall (1969).

TEACHER PREPARATION

It was projected that ten elementary classroom teachers would be selected by administrators of cooperating school districts to participate in the Program on an in-service basis. Ten teachers were selected: eight taught first and second grade, one taught third grade, and one taught fourth grade. These teachers were designated consulting teachers-in-training. Eight consulting teachers-in-training successfully completed the first year of the Program, while two teachers withdrew for personal reasons. However, these teachers continued to employ the methods and principles studied, and to undertake service/research projects with handicapped children in their classrooms. One of these teachers has become a special class teacher.

Consulting teachers-in-training presented the results of their projects to other teachers in their school districts. These presentations apparently led to the consulting teachers-in-training helping fellow teachers conduct projects with handicapped children in their classrooms. Although consulting work had not been anticipated for the first year of the Program, one indication of the success of this consulting work is that two of the consulting teachers-in-training were granted additional release time for consulting before the end of the school year. Furthermore, for the ensuing year, seven consulting teachers-in-training have been released an additional day, thus providing two days per week for consulting and research activities. School districts are providing for these additional consulting services through regular school budgets.

In order to provide more individualized instruction and research assistance, it was projected that five graduate fellows would be selected to work with the consulting teachers-in-training. However, four qualified graduate students were available and were designated University of Vermont Consulting Teachers. Therefore, with the eight consulting teachers-in-training, the proposed ratio of one graduate fellow for every two participating teachers was preserved. University of Vermont Consulting Teachers worked with participating teachers to help them undertake effective educational programing and research. They insured that the measurements of children's progress were accurate, provided feedback concerning procedures employed, and disseminated information about the Program to other school personnel.

SERVICE AND RESEARCH

By undertaking research projects which focused on devising teaching/learning procedures to promote the educational and social growth of handicapped learners, it was projected that ten participating teachers could provide special educational services for 20 handicapped learners. In actuality, consulting teachers-in-training conducted service/research projects for 35 handicapped learners enrolled in their respective classrooms. This higher incidence is perhaps explained by the fact that cooperating school districts often placed handicapped learners in participating teachers' classrooms. In addition, by consulting with teachers who requested their services, consulting teachers-in-training served 15 other handicapped learners. One project involved an entire classroom of 20 children.

Although an objective of the Program is to avoid labeling handicapped learners, 23 of the 50 children had been classified as handicapped by other professionals. Diagnoses included specific learning disability, multiply handicapped, emotionally disturbed, borderline mentally retarded, and hyperkinetic. Other children were referred on the basis of deficit and/or inappropriate behaviors including temper tantrums, disruptiveness, inattention, lack of achievement, incomplete assignments, and incorrect work.

Ultimately, learning handicaps were defined on the basis of daily measures of behavior as they occurred in the classroom. The main focus was on academic behaviors such as attending to learning materials and teaching events, completion of assignments, and accuracy. Other behaviors studied included soiling, speaking

out, being out of seat, obeying teacher commands, and thumbsucking. The project involving an entire class focused on having the children in their seats at appropriate times, a management problem many teachers face.

Teaching/learning procedures were developed for the 50 handicapped learners. The effectiveness of a particular procedure was monitored on the basis of changes in behavior of concern as indicated by the graphs depicting daily measures of behavior. The major emphasis was in the evaluation of procedures readily available in the school environment. A few studies involving the home environment were also undertaken. Through the application of a complete functional analysis of behavior (see pp. 12-14), many procedures were found to be effective in increasing social and academic behaviors of handicapped learners in regular classrooms. The permanence of behavior change was assessed by teachers obtaining postcheck measures of behaviors of concern. Other indications of continued improvement included verbal or written reports from parents and other teachers as well as report card grades and school promotions.

One effective procedure was that of giving teacher attention for appropriate behaviors. In many studies, the teacher praised the child at a high rate when he was behaving appropriately (such as sitting in his seat or working on assignments) and ignored the child when he was behaving inappropriately. In other studies, the teacher immediately and frequently corrected work completed during a work period by placing C's on correct answers and leaving incorrect answers unmarked.

Another effective procedure was that of giving tokens for appropriate behavior. The teacher arranged to give frequent praise plus tokens for the behaviors he wished to increase. In two studies, these tokens were later exchanged for back up reinforcers such as classroom privileges, playtime, small toys, and food. In the project involving all children in a classroom, no back up reinforcers were employed as tokens and praise alone was effective in increasing the number of occasions of being in seat at appropriate times.

Bar graphs for academic behaviors were also found to be effective. The teacher prepared a bar graph showing the number of problems correctly completed. On days when the child correctly completed a number of problems equal to or greater than that completed on the previous day, the teacher gave him the graph. He then colored the bar to the height depicting the number correct. This procedure was effective in increasing accuracy (percentage correct) as well as rate correct (number correct in a specified time period).

Functional analyses of the effectiveness of a few procedures were not completed. However, some of these procedures were correlated with beneficial changes in behavior. For example, one teacher arranged to have a classmate praise a child when he completed assignments. Two teachers arranged with parents that when their child met a specified criterion, he could exchange a note from the teacher for specified home privileges. As a result of such peer praise or home involvement, there were marked increases in behaviors of concern.

CONCLUSION

It seems that teachers with the help of consulting teachers can provide special educational services to handicapped learners in regular elementary classes. Fifty children were so served during the first year of the Program. The results of the Program's studies indicate that the education of handicapped learners does not depend solely on the discovery of new teaching/learning procedures. By arranging consistent, systematic, and responses-specific applications of already available procedures (e.g., teacher praise), the teacher can promote the academic and social growth of handicapped learners.

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Appendix

Cost Comparisons of a Consulting Teacher versus a Special Class Approach

Estimated costs of a consulting teacher approach.

It is estimated that a full-time consulting teacher, with the assistance of an aide, and in cooperation with other teachers with whom he will share his skills and knowledge and to whom he will provide consultation, will be able to provide special services to 40 handicapped learners during a school year. Each consulting teacher-in-training during the 1968-1969 school year served an average of approximately six handicapped children. These services to handicapped children were provided through one half day of release time per week, the other half being spent in studies and research activities. If a consulting teacher were to have five full days a week to serve handicapped children, 10 times as much time would be given to these services. It could be estimated, then, that a consulting teacher could serve six times 10 or 60 handicapped children. Thus, a prediction of 40 children is probably conservative.

With an estimated 8400 unserved handicapped children in regular classes and each consulting teacher serving 40, a projected 210 consulting teachers would be required in Vermont.

An aide to the consulting teacher will be essential for the consulting teacher to maximally serve handicapped children through working with regular class elementary teachers. This

aide will serve in several roles. One role would be technical in that the aide would graph daily measurements of progress of handicapped children and keep records of the progress of handicapped children throughout their schooling. The aide would also observe handicapped children in classrooms, and take measurements similar to those the teacher takes to insure that these measurements are objective and accurate. An additional role of the aide will be that of clerk/typist to help the consulting teacher in the preparation of reports. With the aide, and several years of consulting experience, a consulting teacher may be able to serve far more than the 40 children here projected.

Since the 8400 children would be served within regular classrooms, a consulting teacher approach to the education of handicapped children would require no additional classrooms. However, office space and equipment for the consulting teacher and his aide would have to be provided. Assuming that such space is not available, 210 office areas would have to be constructed and equipped. With 450 square feet per area and construction costs of $25.00 per square foot, each office complex would cost $11,250. to construct. Estimating that each office complex would cost about $3,000. to furnish and equip with desks, chairs, filing cabinets, typewriter, and dictaphones, each office would cost $14,250. to construct and equip. The cost for 210 offices would sum to $2,992,500.

The present cost of preparing a consulting teacher is approximately $12,000. This cost exceeds that of preparing a

special class teacher, partially because of the greater time needed for full preparation of the consulting teacher (two full years and one summer versus one year), and partially because the preparation of consulting teachers includes intensive educational research. The cost of preparing 210 consulting teachers would be $2,520,000.

It is estimated that the activities of each consulting teacher and his aide will cost $20,000. per year. This figure includes salary for consulting teacher and aide, special learning materials for 40 children, travel, office supplies, and office maintenance. Thus, approximately $4,200,000. per year would be the cost of maintaining 210 consulting teachers in Vermont. The $4,200,000. would be in addition to elementary per pupil costs.

Estimated costs of a special education approach*.

With a projected average special class size of 12 children, and with the current average regular class size of about 25, it is apparent that a special class approach would require constructing and equipping additional classrooms. An economical special class approach to provide classrooms for the 8400 handicapped learners now in regular classes would be to designate 700 existing regular classrooms as special classes with 12 children per class. As 9100 non-handicapped children would then be displaced, at

* Estimates of numbers of children in classes, square feet requirements of classes, and class operation, construction, and equipment costs are based on data available from the Vermont State Department of Education as of May 12, 1969.

25 children per class an additional 364 classrooms would have to be constructed and equipped. At $25.00 per square foot, with 750 square feet per class, each of these classes would cost $18,750. to construct. About $1500. would be required to equip these classrooms with desks, chairs, blackboards, and audio-visual equipment. Thus, each classroom would cost $20,250. to construct and equip. The 364 classrooms would cost $7,371,000. to construct and equip.

With 12 children per class, 700 special class teachers would be required in Vermont to serve the 8400 children. As a shortage of at least 200,000 teachers required to serve the educational needs of handicapped children has been projected for the United States in 1969*, it seems that the 700 teachers would have to be trained rather than simply hired. Estimating that it would cost $5,000. (including tuitions, fellowships, and program support money) to provide one full year of graduate level preparation for a special class teacher, training the 700 teachers needed in Vermont would cost $3,500,000.

Currently it is estimated that $13,000. per year (inclusive of teacher salary and educational supplies for 12 children) is required to operate a special class. The per year cost of operating 700 special classes would then total $9,100,000. With an average elementary per pupil cost of $525. and 8400 handi-

* Heller, H.W. Training of professional personnel. Exceptional Children, 1968, 34, 539-544.

capped learners, $4,410,000. of existant money might be made available toward the operation of special classes. Then $9,100,000. less $4,410,000. or an additional $4,690,000. would be required for the yearly operation of the 700 special classes.

Summary.

For construction and equipment, the consulting teacher approach would cost $2,942,500., while a special class approach would cost $7,371,000. Thus, a consulting teacher approach offers a saving of $980,000. in the preparation of professional personnel.

As approximately $4,200,000. per year above average elementary per pupil cost would be required to maintain the operation of 210 consulting teachers, while an estimated $4,690,000. above per pupil costs would be required to maintain 700 special classes, the consulting teacher approach would offer a yearly saving of about $490,000.

That a consulting teacher approach would be less costly to Vermont than a special class approach should be clear from the above estimates and cost comparisons.